TRANSACTIONS OF THE NEW YORK SURGICAL SOCIETY.

Stated Meeting, November 22, 1899.

The President, B. FARQUHAR CURTIS, M.D., in the Chair.

NEPHRECTOMY FOR RENAL CALCULUS.

DR. ALEXANDER B. JOHNSON presented a woman, aged thirty, married, multipara, the last child born ten years ago, who was admitted to the Surgical Ward of the Roosevelt Hospital on September 18, 1899.

Her health had been gradually failing for seven or eight years. From time to time she had suffered from chilly sensations and soreness in the lower part of the abdomen, with frequent and painful urination. Six months before she had had a tolerably sharp chill, accompanied by vomiting and pain in the median line of the belly over the bladder. At this time she also began to suffer from frequent and painful urination, not relieved by irrigation of the bladder. Recently she had complained of slight pain and tenderness over the region of the left kidney, but not of sufficient intensity to cause more than a mere sensation of discomfort. She had never had hæmaturia, nor anything resembling an attack of renal colic. She had lost much flesh and strength.

Palpation of the abdomen revealed nothing abnormal but slight tenderness in the left lumbar region. The left kidney could not be felt.

The patient was feeble and anæmic, neurasthenic, and mentally depressed. Temperature, 99° F.; pulse, 104, and feeble.

She complained greatly of constant pain in the urinary bladder, and urinated with great frequency day and night. The urine was cloudy, acid, of diminished specific gravity, and contained a large amount of pus. No tubercle bacilli, but many cocci.

September 27.—The patient was placed in the lithotomy position;

the bladder was irrigated repeatedly and thoroughly with boric acid solution until the fluid returned without apparent contamination or admixture of pus. Cocaine was then introduced into the urethra, and after an interval of eight minutes the bladder was again thoroughly irrigated and emptied. Harris's double catheter was then introduced, and in the course of half an hour about a drachm of rather thick pus was collected from the left side.

A drachm or more of urine was collected from the right side. This specimen also contained numerous flocculi of pus. This examination having proved unsatisfactory, the patient was chloroformed, placed in the exaggerated lithotomy position, the urethra was dilated, and one of Kelly's specula was introduced into the bladder.

The orifice of the left ureter was easily recognized by the appearance of intermittent gushes of moderately thin pus. The metal catheter was then introduced into the right ureter, the speculum withdrawn, and the catheter tied in place. In the course of the following six hours three ounces of clear urine were obtained from the right kidney.

The specimen was of normal specific gravity, and contained no pathological ingredient other than a few red blood cells. Following this examination, the patient suffered on the next day from a rather threatening attack of syncope.

On account of her generally enfeebled state, operation was postponed until October 10, stimulants being administered meanwhile, when she was etherized, and a cut was made one inch below and parallel to the last rib, extending from the edge of the rectus in front to the outer border of the erector spine behind. The kidney was exposed behind the peritoneum; the organ was moderately enlarged and firmly adherent to its fatty capsule. It was normal in shape, and palpation of the organ gave the signs of fluctuation. Blunt enucleation with the hand was made without difficulty and the pedicle exposed.

The renal vein was isolated and surrounded by a catgut ligature; a heavy clamp was placed upon the renal artery and left *in situ*. The kidney, with its ureter still attached, was cut away from its remaining attachments. The ureter was divided with scissors three inches from the kidney.

The condition of the patient at this time was not very good, although but little blood had been lost, and she was given an intravenous salt infusion of 1000 cubic centimetres at a temperature 118° F. into a vein at the bend of the elbow.

The ureter, which appeared to be only moderately thickened and dilated, was cauterized and ligated with catgut.

Irrigation of the wound was followed by deep and superficial sutures of catgut and silk respectively, except for one and one-half inches at the posterior angle, where a piece of aseptic gauze was inserted for drainage, and where the handle of the artery-clamp was allowed to protrude. Aseptic gauze dressing.

The kidney measured five by three by two inches. A section along its convex border opened into a series of abscess cavities containing thin, reddish-yellow pus. In the centre of each abscess cavity there projected a prolongation of a stone whose central mass occupied the pelvis of the kidney, with another pointed prolongation extending downward into the ureter. The stone consisted of a central mass about one and three-fourths inches by one and one-half inches by one-half of an inch, which occupied the renal pelvis and the beginning of the ureter. From the central mass there projected six secondary processes from one-half of an inch to one inch in length, and from one-third of an inch to three-fourths of an inch in diameter, which occupied the centres of the several abscess cavities. The greatest length of the entire stone measured two and one-half inches. The weight of the stone in its dried condition was approximately 250 grains.

Its surface was rough; it was moderately hard, somewhat brittle; it appeared to consist of urates.

The kidney was largely converted into a series of pus sacs, except at one pole, where a considerable mass of kidney tissue remained in a condition of chronic inflammation. The sacs were for the most part rather thin-walled.

Upon exposure of the organ in the wound it was noted that while fluctuation was distinct, yet the fluid contents were under no great tension, drainage through the dilated ureter having remained free, which might account for the failure to detect any very evident enlargement of the organ upon physical examination. The almost complete absence of tenderness appears, however, unusual.

The convalescence of the patient was uneventful; she suffered no rise of temperature above 100° F.

The clamp upon the renal artery was removed at the end of forty-eight hours, and the wound healed *per primam*, except for the drainage sinus, which soon became clean and gave no further trouble. The patient's bladder was irrigated after the operation daily with a weak solution of potassium permanganate 1–3000 G.

The painful and frequent urination from which she had suffered rapidly passed away, and was entirely gone at the end of the month, and at present her urine is clear and free from abnormal ingredients. No considerable diminution of the twenty-four hours' quantity was noted as the result of the operation, and at the present time, forty-three days after the operation, she has gained greatly in health and strength and seems to be in good health.

The case is one of those in which a kidney lesion gives symptoms referable chiefly to the urinary bladder.

DR. WILLY MEYER said that several years ago, following the advice of a Russian surgeon, he resorted to the clamp method in six consecutive cases of nephrectomy. In five instances the clamp was removed at the end of forty-eight hours, and in one at the end of seventy-two hours. There was no trouble, and all the cases ended in recovery. Shortly afterwards, Dr. Meyer said he was asked to see a young lady, the daughter of a colleague, who was suffering from tuberculosis of the left kidney. A nephrectomy was done at the patient's home, the operation proving extremely easy. The clamp was employed, and left *in situ* for forty-eight hours; then, with the usual precautions, it was slowly loosened and extracted. Its withdrawal from the wound was immediately followed by a profuse hæmorrhage. This was checked by firm, continuous pressure until the renal artery and vein, after considerable unavoidable delay, were exposed; the walls of the vessels were gangrenous, and again ligated with considerable difficulty. A saline infusion was then given. Death occurred from acute sepsis seventeen hours later.

Dr. Meyer said that since the occurrence of the unfortunate accident in the case above reported he had discarded the use of the clamp, and he never could be induced to employ it again, in ordinary cases, where ligation of the pedicle was well feasible. Previous to the experiments just related, he had looked upon it as a safe and simple method of expediting the removal of the kidney.

DR. FRED. KAMMERER said that the only reason he could see for applying a clamp was the inability to pass a ligature properly and tie it, owing to a short pedicle or a very large kidney. He saw no objection to the temporary application of a clamp, which could be removed after the kidney had been cut away and replaced by ligatures.

DR. JOHNSON, in closing, said that usually, in extirpating the kidney, he was in the habit of applying a ligature to the artery and vein, separately, but occasionally, as in the case he reported, where

time was of much consequence, the patient being in poor condition, he found it more convenient and time-saving to use the clamp. The clamp has been frequently employed at Roosevelt Hospital by Dr. McBurney and other surgeons, and the speaker said he was unaware of any case where a secondary hæmorrhage had resulted from its use.

TETANUS TREATED BY INTRACEREBRAL AND INTRAVENOUS INJECTIONS OF ANTITETANIC SERUM.

Dr. Alexander B. Johnson presented a man, aged thirty-one years, who came under his care through the favor of Dr. Frank B. Petersen, of Cutchogue, L. I., on the evening of October 19, 1899, with the history that on October 11 he had accidentally scratched the ulnar surface of his left forearm by sliding it across the top of a fence, which formed a portion of an enclosure used as a pig-pen. The refuse of a butcher-shop and horse manure were frequently pitched over this fence.

The abrasion produced was of trifling character, and no attention was paid to it, except that the patient wiped away the drop or two of blood which appeared upon the skin with his tongue.

On Tuesday, October 17, in the evening, he noticed during conversation a slight stiffness of the jaw muscles. The next day, Wednesday, the stiffness was more marked, and he had some difficulty in swallowing solid food.

On Thursday morning, the lockjaw was increased, and he noticed some feeling of stiffness in the muscles of the neck. He was seen at noon on this day by Dr. Petersen, who at once brought him to New York, having diagnosticated "tetanus." On Thursday evening, when first seen by Dr. Johnson, he did not appear to be seriously ill; his temperature was 99.8° F., and his respiration 24; pulse, 80. He was perspiring freely. Trismus was marked, but not absolute; his teeth could be separated about one-half of an inch. Efforts to talk caused spasm of the face and sardonic grin.

The left upper extremity was slightly stiff objectively, slight resistance being encountered on passive motion; the muscles of the neck, both flexors and extensors, were firmer than normal, as well as the muscles of the chest wall and abdomen. The patient stated that a subjective sensation of stiffness in the voluntary muscles throughout the body had been present during the day.

He also complained of feeling cold, and has since said that during his entire illness this sensation of cold was his most annoying symptom.

He does not remember having suffered from any acute pain in the contracted muscles, even during the several general convulsions through which he passed; but his sensations during the greater part of his illness may have been forgotten, since he was more or less delirious during the time.

Upon further examination, a red, painless, insensitive, rather firm nodule, oval in shape, three-fourths of an inch in its long diameter, and apparently caused by an inflammatory exudate in the thickness of the skin, was observed upon the ulnar aspect of his left forearm rather nearer the wrist than the elbow.

The nodule was immediately excised under cocaine anæsthesia. The excision included an area of healthy skin and the underlying subcutaneous tissues. The wound was sutured. The patient also received a subcutaneous injection of Parke, Davis & Company's "Antitetanic serum," to the amount of ten cubic centimetres. The subcutaneous tissues of the chest-wall in front, of the deltoid regions, the arms, and the front of the thighs, were the regions in which this and the subsequent injections were made.

The injections were repeated every four hours, day and night; one of the little bottlesful being used at each injection. He was also given fifteen grains of chloral hydrate and thirty grains of sodium bromide every four hours, by the mouth. He was put upon a liquid diet of the most nourishing character, including milk, beef-juice, egg-nog.

The muscular rigidity gradually increased during Friday, the following day, and on the same evening he was decidedly worse, and had a single tonic general convulsion with opisthotonos. He complained of headache, had frequent spasmodic contractions of the muscles of the jaws, thorax, and upper extremities; perspired profusely, and was able to swallow only with difficulty.

On Saturday afternoon, October 21, he was prepared for operation, and, under chloroform anæsthesia, two small openings were made in his skull on either side of the median line, at the centre of a line drawn from the external angular prominence of the frontal bone to the middle point of the distance from the root of the nose to the external occipital protuberance.

Five cubic centimetres of the serum were then injected slowly into each cerebral hemisphere, practically the operation of Roux and Borral.

Upon the evening following the operation, the patient complained of severe headache; the subcutaneous injections were continued; his

temperature rose to 100.6° F., otherwise his condition remained unchanged.

There was certainly no marked diminution in the muscular rigidity for forty-eight hours following the injection into the brain. He was very drowsy most of the time, and the chloral and bromide were diminished to once in six hours.

In the evening of Monday, October 23, he was able to swallow with a little less difficulty, and that night he slept about six hours.

The rigidity on Tuesday, October 24, was slightly less; the bromide and chloral were omitted, and the antitoxin was given less often, once in every six hours.

Upon Wednesday, October 25, in the afternoon, he had a general tetanic convulsion with profuse sweating. The chloral and bromide were resumed every six hours. His temperature at this time was 100.2° F., his pulse 80.

During the night he became delirious and slept but little. Upon the evening of October 26 an erythematous rash appeared upon the neck and chest. He was still delirious. His temperature was the same, his pulse 96. The antitoxin was stopped and chloral and bromide were resumed every four hours. It was found difficult to make his bowels move.

Upon Friday, October 27, the wounds upon his head and arm were dressed and found healed. His urine was passed involuntarily. The muscular rigidity was persistent, and marked spasms of both upper and lower extremities occurred from slight causes of irritation. The injections of antitoxin were resumed every six hours. Upon the evening of this day he had a general erythematous rash upon the chest, abdomen, and extremities. The chloral and bromide were omitted, and he was given occasional small doses of morphine hypodermically when the convulsive movements prevented sleep.

During the forty-eight hours of October 28 and 29, his kidneys excreted but a few ounces of urine, which, however, appeared to contain no abnormal ingredients.

He was given large rectal enemata of salt solution, which speedily produced an abundant flow from the kidneys. October 28 and 29 he continued delirious, the muscular rigidity remained the same, and upon the 29th his temperature having risen to 102, the antitoxin was increased to once every four hours. His temperature gradually fell, and upon the 31st it reached 99.

Upon November 1 he was restless, noisy, and very delirious, and in the evening of that day his temperature had risen to 102½ and his

pulse to 108. He was given one-half an ounce of whiskey every three hours, together with two minims of the fluid extract of digitalis.

Upon November 3 the muscular contractions were markedly diminished in the upper part of the body, although his legs were quite stiff. The antitoxin was stopped.

Upon the next day his temperature fell to normal and scarcely rose again above 99½. From this time on his convalescence may be said to have commenced. The delirium while persisting at night disappeared in the daytime, and the muscular rigidity gradually lessened.

Upon November 10 he was allowed to sit up, his mind being clear. His legs and back were still somewhat stiff, but he was able to open his mouth very well. Upon November 12 he walked about a little, was quite rational, and began to regain his strength. Upon November 16 he was allowed to walk out of doors, had a good appetite, and slept well at night.

At the present time, November 22, he states that he is still able to feel a slight sensation of stiffness, while walking, in his back and legs. His general health is excellent, except for a considerable loss of flesh. From the beginning of the treatment to the end no sudden curative effect of the antitoxin was to be observed, nor does it seem that any argument for or against the intracerebral injection of the antitetanic serum is to be drawn from this case.

No bacteriological examination was made of the excised tissues of the forearm, the diagnosis of tetanus appearing sufficiently certain.

The patient received in all forty-nine doses of the serum; each dose contained ten cubic centimetres.

Except for the erythematous rash spoken of, no ill effect appeared attributable to its use.

In a subsequent case, if improvement did not follow the intracerebral injection after twenty-four or thirty-six hours, the reporter would be inclined to inject the serum into the spinal canal by lumbar puncture. He was not sufficiently familiar with the method devised and practised by Dr. Frank Hartley, of injecting the serum into the lateral ventricle of the brain, with the idea of causing its rapid entrance into the cerebral substance by absorption through the vessels of the choroid plexus, to have formed a definite opinion; but he was informed by anatomists that there are theoretical grounds at least for the assumption that the choroid plexus is an organ which secretes rather than absorbs; if such be the case, this method may not be effective.

OSTEOPLASTIC RESECTION OF SKULL FOR TRAUMATIC EPILEPSY.

DR. FRED. KAMMERER presented a case in which an osteoplastic resection of the skull had been done for traumatic epilepsy, to illustrate the advantages of the use of Gigli's saw for separating the bone. He had found some of the instruments recommended by Dr. Buchanan in the *Medical Record*, about a year and a half ago, of great value, especially his small trephine and his dural separator. He had tried the method in two cases, and could say that he preferred it to chiselling of a groove into the bone. He generally described a pentagon with the knife, at each angle of which he bored a hole with the trephine. This is very readily accomplished with the instrument of Dr. Buchanan, which makes a very small opening; so small, in fact, that it becomes necessary to chisel away some of the cancellated substance of the inner layer of the skull in order to pass the dural separator between the dura and tabula interna from one trephine opening to the other. This is readily done by loosening the dura with Buchanan's dural separator; but he had not been well able to pass the separator from one opening to the other, so that he could then push the wire-saw along its groove as Buchanan suggests. Moreover, after the dura has been separated from the inner table, it is a simple matter to pass a silver probe with an eye bent to an appropriate curve from one trephine opening to the next, and with the aid of this the wire of Gigli's saw. In neither of the two operations has any harm been done to the dura during the various manipulations, although no special precaution was taken to prevent the same. Obalinski, Lauenstein, and Keen have also recommended the use of Gigli's saw for osteoplastic resections on the skull, but have employed different instruments than those of Buchanan. The final result in this case is certainly very good, there being perfect adaptation of the bone-flap into its old place. The time required to remove the piece of bone was from twenty-five to thirty minutes. He thought he would be able to do it in less time in the future. With the chisel it would have taken much longer, according to his experience, at least.

DR. JOHNSON asked what the greatest distance was which could be left between the trephine holes in operating on the adult skull?

DR. KAMMERER said that in the two cases where he had resorted to this method he had left from an inch and one-half to two inches between the trephine holes.

DR. GEORGE R. FOWLER said that over two years ago, August 14, 1897, the use of the Gigli saw in these operations was suggested by

Obalinski, of Krakau, in an article which appeared in the *Centralblatt für Chirurgie.* He made the trephine holes sufficiently close together to pass the saw from one to another by means of either a Deschamp needle or a properly curved canula.

DR. B. F. CURTIS said he thought this method of operating on the skull must have been developed by a number of surgeons simultaneously. The speaker said that he had already operated by the method when he saw a paper on the subject by Keen (*Philadelphia Medical Journal,* January 1, 1898) and another by Obalinski (*Centralblatt für Chirurgie,* 1897, p. 857).

Dr. Curtis said he had resorted to this procedure in eight or nine cases, and the chief criticism he had to offer upon the instruments presented was that the trephine openings were too small. In working on the child's skull, we can get along with very small openings; but in adults the opening should be at least a third of an inch in diameter in order to get the instrument through at a proper angle to pass under the skull. Dr. Curtis said he usually employed a three-eighths-inch trephine. The method certainly was a time-saving one. If the bones are thin, one can do the operation in from twenty to twenty-five minutes; with thicker skulls it takes longer. Another advantage of the method is that a bevel-shaped cut is made, and the bone-flap is supported at the edges when it is dropped back into place.

DR. WILLY MEYER said that Lauenstein, of Hamburg, suggested the use of a watch-spring with a perforated small metal knob at its tip, in order to facilitate the passage of the saw from one trephine to another, and claimed that by this method the saw could be easily drawn through. Before he hit upon this idea, a piece of fish-bone perforated at its end had been used for the same purpose.

DR. FREDERICK KAMMERER said he was fully aware that the method he had described had been followed some time before Dr. Buchanan suggested the use of his instruments. Lauenstein, Keen, and others had done the operation with the use of Gigli's saw. Personally, the speaker said he had found some of Dr. Buchanan's instruments very satisfactory. In the case he had reported, the skull was about one-quarter of an inch thick, and no difficulty was experienced in getting through it with the little trephine.

Dr. Kammerer said he thought it decidedly advantageous to make the trephine openings as small as possible. The chiselling of a small groove in the trephine opening to facilitate introduction of the dural separator is a very simple matter, and can be done in a few seconds. Then the separator can easily be introduced.

TRANSPLANTATION OF SKIN-FLAP OVER EXPOSED TENDONS.

DR. B. FARQUHAR CURTIS presented a young woman who had suffered for several years from an extensive tubercular tenosynovitis of the wrist. Two operations had been done previously by Dr. Curtis, but recurrence took place. On October 5, at St. Luke's Hospital, he dissected out all the infiltrated tissue which surrounded the common extensor tendons, and had destroyed the extensor tendons of the thumb, cutting away the skin very freely, and then covered the raw surface with a flap of skin from the patient's abdomen, left attached by a broad pedicle. Motion was begun very early, and the operation has left the woman with the free use of her fingers. The tendons were entirely exposed for two inches in the wound, being covered only by the skin-flap, but no adhesions took place, even to the skin-flap. The latter was gradually cut away from its pedicle, not being completely divided until November 3.

THE TREATMENT OF TETANUS BY INJECTIONS OF ANTITOXIN.

DR. ROBERT ABBE read a paper with the above title, for which see page 273.

In connection with this paper, Dr. Abbe presented two boys whom he had treated for tetanus during the past summer, the history of whose cases was contained in his paper.

DR. JOHN ROGERS, JR., said that his experience with the tetanus antitoxin manufactured by Messrs Parke, Davis & Company was much more satisfactory than with that furnished by the City Board of Health.

The speaker reported the following case which had come under his observation this year: The patient was a man who received a pistol-shot wound on the Fourth of July, and eighteen days later developed tetanus. The following day the muscles of the back were involved with marked opisthotonos. Dr. Rogers trephined the skull, and injected the contents of two vials of the New York Health Board's antitoxin into the lateral ventricles without producing any untoward symptoms or causing any change in the man's condition. The disease steadily progressed and death occurred four days later.

The speaker referred to two other cases of tetanus,—one a rather acute case of head tetanus, the other of the ordinary type, in both of

which subcutaneous injections of the New York Board of Health antitoxin were used without producing the slightest effect.

Dr. Rogers said he did not think the severity of the symptoms bore a constant relation to the length of time it took them to develop after the occurrence of the injury. In one of the cases which he had referred to, the symptoms did not develop until eighteen days after receipt of the injury, and on the second day the entire body had become involved. The severity of the infection can best be judged by the rapidity with which the symptoms progress after their development.

DR. G. R. FOWLER said that in a case of exceptionally rapid developing tetanus which came into his service at the Brooklyn Hospital last June, the symptoms manifested themselves on the third day, and were most pronounced in character. The convulsions were of very frequent occurrence, being excited even by the slightest movements of persons in the room with the patient, or by the turning on of the light. There was opisthotonos and the usual difficulty of swallowing. In this case, Dr. Fowler said, he injected five cubic centimetres of the tetanus antitoxin into each lateral ventricle, supplemented by the injection of ten cubic centimetres into the subcutaneous tissue of the buttocks, and later by twenty cubic centimetres of diluted serum into the arm. Death occurred six hours afterwards.

Dr. Fowler expressed the opinion that those cases of tetanus in which the symptoms develop soon after the receipt of the injury will in almost every instance end fatally, while those in which the antitoxin or the use of chloral or other remedies prove beneficial belong to the type which develop later. Experience with the antitoxin is still too limited to enable one to determine whether the remedy will bear out clinically the hopes that have been held out in its behalf. In most of the cases which have recovered after its use, other remedies, particularly chloral, have also been employed; and in some parts of the country, where the disease has been quite prevalent and of a comparatively mild type, quite a large number of recoveries have been reported under the use of chloral alone.

DR. WILLY MEYER said that during the epidemic of tetanus in this city last summer he observed a rather severe case. The patient was a boy eleven years old, who received a pistol-shot wound on July 4. Seven days later, as the first symptom, a spastic contraction of the injured arm occurred. Chloral and bromide were first employed; soon trismus appeared. The serum of the Board of Health had given out, therefore the tetanus antitoxin prepared by Roux, at the Pasteur

Institute in Paris, was resorted to. According to directions on the vials, twenty cubic centimetres were injected on the first, and half that quantity on the following day. No improvement being noticeable, the injections were repeated daily for ten days or more, fully one hundred to one hundred and twenty cubic centimetres being injected per day into the subcutaneous tissue of the thighs, abdomen, and the infraclavicular spaces, besides a large amount of a three-per-cent. carbolic solution. In this case there was never any difficulty in swallowing or breathing, but all the other muscles in the body became involved. One day Dr. Meyer was ready to do an intracranial injection, but the patient's condition again improved. The patient finally recovered.

Dr. Meyer said that in a severe case of tetanus he would be inclined to follow the method of Kocher, who, under cocaine, drilled a minute hole through the skull, and through this introduced the antitoxin. Various writers have reported cases of tetanus which were successfully treated with hypodermic injections of a three-per-cent. solution of carbolic acid, according to Dr. Borrelle's advice. Some of the patients received as much as five or six decigrams of this solution within twenty-four hours, and the injections being repeated for several successive days. As mentioned above, Dr. Meyer had made free use of these additional injections in his dose.

Dr. Meyer referred to the peculiar fact that most of the cases seen last summer were induced by toy-pistol-shot wounds, and he suggested that this may have been due to the use of impure powder. He thought the true cause of the epidemic could have been ascertained if bacteriological investigations of the different parts of the cartilages had been made by the proper authorities. With proper orders and regulations of the Board of Health, based upon such investigations, a similar epidemic could be avoided in the future.

Dr. Arthur L. Fisk said he had, fortunately, had the opportunity to watch the cases of tetanus which Dr. Abbe had reported in his paper. The use of the antitoxin in those cases effected results which offered a striking contrast to those observed after the old methods of treatment. With the exception of the second case, the injections brought speedy relief, and lengthened the intervals between the spasms. Dr. Fisk said he was convinced that the mortality in the series of cases reported by Dr. Abbe would have been much higher if the serum had not been pushed as it was. Its injection into the brain-substance did not apparently do any harm; there was no resulting paralysis.

The speaker called attention to the severe muscular spasm upon the affected side, especially in the group of muscles in the immediate neighborhood of the injured parts. In those cases where the injury was received in the palm, there was a striking contraction of the fingers, wrist, and forearm, and those were the last of the contractions in the body to yield.

DR. ROYAL WHITMAN said, with reference to the remarks of Dr. Meyer, that he had seen five cases of tetanus at the Boston City Hospital in the summer of 1882. These, and a number of others occurring in Boston and its vicinity, were caused by wounds of toy-pistols carrying an ordinary blank copper cartridge. The sale of the weapons was afterwards prohibited by the authorities.

All of the hospital patients died, and he thought that no recoveries were reported among the other cases.

DR. WILLIAM G. LE BOUTILLIER said that he had never seen a case of tetanus recover. He had seen in all sixteen or more cases, and had taken cultures from a number of others after death. During the past summer, two cases had come under his observation; in both injections of antitoxin were resorted to,—in one, intraventricular, in the other, subcutaneous,—and both ended fatally. A third case, which he had at first regarded as tetanus, came into the hospital during the first week of September of the present year. The patient was a boy who had been ill six days. The history obtained was that during the week previous to his illness he had fallen, receiving some abrasions of the hands and forehead. A few days later his mother noticed that he was unsteady in his gait, would fall occasionally, his utterance was thick, and he talked a little queerly. A few days before he was sent to the hospital he had a convulsion during the night, and his jaw seemed stiff.

The boy was admitted to the medical side of the hospital, and his case was diagnosticated as meningitis. Dr. Le Boutillier saw him by chance two days later, and thought the symptoms were so typical of tetanus that he had him transferred to the surgical ward, where he remained for three weeks. There was no loss of consciousness, no delirium, but the slightest irritation induced a general convulsion. There was trismus, opisthotonos, and difficulty of deglutition. The temperature was 101° F.; there was no eruption. Owing to the long duration of the symptoms, the serum treatment was not deemed advisable. The child during the convulsions became cyanotic and suffered severe pain. The old wounds on the hands and forehead were curetted, and an unsuccessful search was made for the tetanus

bacilli. Large doses of chloral were administered. The boy became much emaciated, although he took his nourishment in fairly satisfactory quantities. After a period of apparent improvement, a recrudescence occurred, with delirium, and the appearance of an eruption on the body. Dr. Le Boutillier said he then became convinced that the boy never had tetanus, and sent him back to the medical ward. Subsequently the spinal canal was punctured, and the fluid withdrawn showed the presence of Weichselbaum's meningococcus.

In conclusion, Dr. Le Boutillier suggested the possibility that some of the cases reported by Drs. Abbe and Johnson were cases of meningitis and not tetanus, as the delirium had appeared to be a marked feature, and this was very unusual in tetanus.

DR. A. B. JOHNSON said that if we are to accept what he believed to be a tolerably well established fact, namely, that the poison of tetanus, after entering the blood, is partly taken up by the nerve-cells, while some of it may still be circulating in the blood, we must acknowledge that there will be a goodly number of cases of tetanus which will be incurable by any method of treatment. After the tetanus poison has localized itself in any particular group of nerve-cells, the antitoxic serum does not particularly affect such cells already involved, but acts more as a protection to other cells not yet affected, at the same time, perhaps, destroying the tetanus poison circulating in the blood. The speaker said he believed there may be a considerable group of cases where all forms of treatment will prove in vain. He also firmly believed that many cases could be cured by the serum treatment; and he had not the slightest doubt that those cases reported by Dr. Abbe which had recovered under the serum treatment would have died without it.

DR. F. TILDEN BROWN asked Dr. Le Boutillier in how many of the sixteen cases of tetanus he had seen were the bacilli found?

DR. WILLIAM G. LE BOUTILLIER said the majority of those cases occurred before much was known regarding the bacteriology of this disease. In the rest of the cases, where a bacteriological examination was made by himself, he had never succeeded in growing the bacilli. In one of the fatal cases which he saw last summer the tetanus bacilli were found.

DR. ABBE, in closing the discussion, said that in one or two of his cases unsuccessful attempts had been made to find the tetanus bacilli. He had no question as to the diagnosis in any one of the nine cases contained in his report.

In connection with the remarks made by Dr. Meyer regarding

the recent epidemic of tetanus following the receipt of shot wounds, Dr. Abbe said he suspected the cause of the infection to be the cartridge-wad, which he believed was made from the pulp of waste-paper picked up in the streets. The speaker said he had sent some of these wads to the laboratory to be examined bacteriologically.

In reporting these cases of tetanus, Dr. Abbe said he did not present the subject with any rose color at all, because that would be entirely unwarranted. He did think, however, that we should continue to use the serum. He did not think the intracerebral injections should be given in every case, as many would recover without it; until the case began to assume a serious outlook, he would depend upon milder measures. He did not regard the operative procedure as hazardous, and he had seen no instance where it resulted in any mental or cerebral injury. In addition to the intracerebral injections, the speaker said he would advise subcutaneous injections and the administration of chloral and bromides; also the application of an ice-bag to the neck, with the idea of controlling the medullary excitement. The calomel purge and the free use of stimulants and nutritive enemata he also considered important. He had frequently seen the temperature fall from one to two degrees after the administration of a calomel purge, which would indicate that a certain amount of the toxines was eliminated or neutralized in this way.

Dr. Abbe said that the results of the serum treatment thus far obtained were certainly encouraging enough to warrant its continuance. No better statistics could be found than six grave cases, all promising fatal issue, out of which four were cured by cerebral injection, including the one reported to-night by Dr. Johnson, and which followed his own in the same service at the hospital. As regards the injection of the serum through a lumbar puncture, the speaker said he had announced this method during the summer, but the cerebral and subcutaneous method seemed as yet wiser. The method has been successfully employed in Germany by Schultz (*Centralblatt für Chirurgie*) in one mild case which recovered.

LIGATION OF THE FIRST PORTION OF THE SUBCLAVIAN FOR ANEURISM, WITH SPECIMEN.

Dr. Fred. Kammerer presented a specimen from a man of forty-eight years, who had contracted syphilis years before. He first noticed a swelling over the left clavicle about half a year ago. When operated on at the beginning of October, he had a well developed pulsating

aneurism of the first portion of the left subclavian artery. The tumor was about the size of a man's fist, and was partly covered by the left sternomastoid muscle and clavicle, appearing at the angle formed by them in the supraclavicular space. On October 18 the left subclavian artery was ligated one inch from the arch of the aorta, after partial resection of both clavicles, the manubrium sterni, and the sternal end of the left first rib. Even then great difficulty was experienced in passing chromic acid catgut ligatures around the vessel. Pulsa-

FIG. 1.—Sarcoma of the shoulder.

tion in the aneurism and left radial artery ceased immediately. Everything went well for the first three weeks, when oozing began from a point of the granulating surface corresponding to the resected end of the left clavicle, at the same time the temperature began to go up. The oozing continued for a little over a week, and the patient was beginning to show the effects of this continual loss of blood, when he succumbed to profuse hæmorrhages on the thirtieth day after operation.

At the autopsy it was seen that the ligature had not been entirely absorbed, and that the vessel had given way at the point of its application. There was no indication of a thrombus in the part lying between the ligature and the arch. In the aneurism itself a thick mass of coagulum was deposited on the entire interior surface.

SARCOMA OF THE SHOULDER.

DR. CHARLES L. GIBSON presented a specimen removed, post-mortem, from a man fifty-eight years old, a native of the West Indies

FIG. 2.—Showing change effected in four months in patient shown in Fig. 1.

and a clergyman by profession. He had always enjoyed good health until January, 1899, when a small, indurated tumor appeared on the left shoulder, which grew very rapidly. Three months after its appearance he consulted Dr. McBurney, who advised disarticulation of the upper extremity. This the patient refused to have done.

He came under Dr. Gibson's care in July, 1899, when the growth had extended to the scapula and neighboring regions. (See Fig. 1.)

The condition was plainly inoperable. He remained in the hospital until the time of his death, on November 10, 1899. During this period he suffered intense pain, which required the administration of large doses of morphine. The appearance of the tumor at this time is seen in Fig. 2, and shows the rapid extension.

The autopsy showed no metastases excepting in the pleura; these were small and apparently quite recent. The weight of the tumor was twenty-five pounds. It had started from the periosteum of the humerus, producing a solution in the continuity of the bone.

The case was interesting on account of the rapid growth of the tumor, the entire duration being only about ten months. The direct cause of death, as not infrequently the case in malignant disease, is not quite obvious. Though suffering greatly, his general nutrition was fairly well preserved. The growths did not involve any organs of functional importance, nor was there any suppuration or septic absorption.